प्राविधिक शिक्षा तथा व्यावसायिक तालीम परिषद्

नेपाल बनेपा पोलिटेक्निक ईन्स्टिच्यूट

पदपूर्ति उप-समिति

बनेपा, काभ्रेको

इलेक्ट्रिकल सहायक प्रशिक्षक
(इलेक्ट्रिकल इन्जिनियरिङ्ग उप-समूह) (सहायक स्तर प्रथम श्रेणी प्राविधिक) पदको
लिखित परीक्षाको पाठ्यक्रम

सेवा : प्राविधिक तथा प्रशिक्षण	प्रशिक्षण समूह : इन्जिनियरिङ्ग प्राविधिक प्रशिक्षण	उपसमूह : इलेक्ट्रिकल इन्जिनियरिङ्ग
पद : इलेक्ट्रिकल सहायक प्रशिक्षक	स्तर : सहायक स्तर प्रथम	
पाठ्यक्रमको रुपरेखा : यस पाठ्यक्रमको आधारमा निम्नानुसार दुई चरणमा परीक्षा लिइनेछ ।		
प्रथम चरण : लिखित		परीक्षा पूर्णाङ्ग : १००
द्वितीय चरण : अन्तरवार्ता		पूर्णाङ्ग : २५

प्रथम चरणः लिखित परीक्षा योजना

पत्र	बिषय	खण्ड	परीक्षा प्रणाली	प्रश्न संख्या	अंक भार	समय	पूर्णांक	उत्तीर्णांक
द्वितीय	सेवा सम्बन्धी प्राविधिक विषय	सेवा सम्बन्धी समूह/उपसमूहको प्राविधिक विषय	बस्तुगत बहुउत्तर (Multiple Choice)	२५	२५X२ =५०	३० मिनेट	१००	४०
			बिषयगत (Subjective)	५	५X१०=५०	१ घण्टा ३० मिनेट		

द्वितीय चरण :: अन्तरवार्ता योजना

बिषय	पूर्णांक	परीक्षा प्राणली
अन्तर्वार्ता	२५	मौखिक

इलेक्ट्रिकल सहायक प्रशिक्षक
(इलेक्ट्रिकल इन्जिनियरिङ्ग उप-समूह) (सहायक स्तर प्रथम श्रेणी प्राविधिक) पदको
लिखित परीक्षाको पाठ्यक्रम

बिषय: सेवा सम्बन्धी सम्बन्धित प्राविधिक विषय

पूर्णाङ्क - १००

1. Electrical Engineering
1.1 Electrical circuit
1.2 Electrical current voltage, resistance, EMF, Potential difference
1.3 Ohm's Law, Kirchoff's Law Joule's Law. Faraday's Law of electro magnetic induction.
1.4 Series parallel connection of resistance in D.C. circuit
1.5 R-L-C circuit connection in series and parallel
1.6 Fundamental A.C circuit
1.7 Three phase system
1.8 Electrolysis
1.9 Electrostatics
1.10 Magnetism and Electromagnetism
2. Electrical Machine
2.1 Single phase transformer: Construction, emf equation, working principle, ideal transformer, loss efficiency.
2.2 Parallel operation of single phase transformer
2.3 Voltage regulation of transformer
2.4 Three phase transformer: Delta / Delta, Star/Delta, Delta/Star open delta
2.5 D.C. generator
2.6 D.C. Motor
2.7 Three phase induction motor
2.8 Synchronous generator and synchronous motor.
2.9 Three phase motor starters
2.9.1 Star delta starters
2.9.2 D.O.L. starters
2.9.3 Starters for slip ring motor
3. Electrical Supply System
3.1 Generation of Electrical Energy
3.1.1 Types of power plants, their classification.
3.1.2 Diesel power plant
3.1.3 Hydro power plant
3.1.4 Type of excitation system of Synchronous generator
3.2 Sub Station
3.2.1 Type of sub station : their advantage and disadvantage
3.2.2 Sub station lay out, pole mounting sub station
3.2.3 Circuit breaker, isolator, reactor
3.3 Supply System
3.3.1Compare A.C. and D.C supply

3.3.2 Type of supply system

3.4 Transmission Lines

3.4.1 Short transmission line

3.4.2 Medium transmission line nominal II type and T-type

3.4.3 Main components of over head line - conductors, supports; insulators, jumper, danger plate; stay wire, stay set.

3.4.4 Types of high voltage under ground cable : construction classification

3.4.5 Conductor spacing; sag; tension; skin effect; corona.

3.5 Distribution System

3.5.1 Typical distribution system lay out diagram

3.5.2 Single phase distribution; three phase distributor

4. Electrical Measurement & Measuring Instrument

4.1 Measuring Instrument

4.1.1 Moving Coil Instrument

4.1.2 Moving iron Instrument

4.1.3 Electrodynomic Instrument: ammeter, volt meter, watt meter, watt meter, power factor meter.

4.1.4 Cathode ray oscilloscope : basic construction, operation and application

4.2 Resistance Measurement

4.2.1 Wheat stone bridge

4.2.2 Kelvin double bridge

4.2.3 Megger: Construction and operation, application

4.3 Shunt and Multiplier

4.3.1 Shunt for extending the rang of ammeter, Multiplier for extending the range of voltmeter.

4.4 Potentio meter

4.4.1 D.C. potentiometer: Construction connection to electrical circuit and application.

4.4.2 Inductive potentiometer: Construction, operation and application.

4.5 Power Energy and Frequency Measurement

4.5.1 Single phase supply connected with watt meter

4.5.2 Power measurement in three phase circuit: three watt meter method and two watt meter method.

4.5.3 Single phase KWH meter, three phase KWH meter: construction working principle, connection diagram.

4.5.4 Maximum demand meter: construction, working principle and application

4.5.5 Frequency meter: Construction, working principle and application.

5. Utilization of Electrical Energy

5.1 Law of illumination

5.2 Filament lamp: construction, working principle

5.3 Fluoresent lamp: construction working principle

5.4 Power of law power factor

5.4.1 Cause of law power factor

5.4.2 Method of improving factor

5.5 Tariff

5.5.1 Objective of tariff
5.5.2 Simple tariff, flat - rate, tariff, block-rate tariff, two part tariff, maximum demand tariff, power factor tariff.
5.5.3 Tarriff system in Nepal

6. Power System control and Protection

6.1 Fuse and MCB

6.2 Type of fuse: Construction, application, time current characteristics
6.3 Isolators contactor, construction, operation, application.

6.2 Circuit Breaker

6.2.1 Air circuit breaker (ACB) : Construction working principle, application
6.2.2 Oil circuit breaker
(a) Bulk oil circuit breaker
(b) Minimum oil circuit breaker, construction working principle and application.
(c) SF6 circuit breaker: construction working principle and application

6.3 Calculation of short circuit MVA for symmetrical fault

6.4 Earthing

6.4.1 Equipment earthing, system earthing
6.4.2 Lightening arrestor, surge absorbers
6.4.3 Safe value of current through human body, step potential touch potential

6.5 Relay and Protection Schemes:

6.5.1 Induction disc relay: construction, working principle application.
6.5.2 IDMT relay: construction working principle application
6.5.3 Buchhlz's relay: construction working principle application.
6.5.4 Transformer differential protection scheme

7. Teaching Learning and Assessment

7.1 TL - method and media.
7.2 Session lesson planning
7.3 Assessment and evaluation

8. General Management and Coordination

8.1 Communication Skills
8.2 Problem solving skills
8.3 Team playing skills
8.4 Report writing
8.5 Coordination/support in co-curricular and extracurricular activities

९.. नेपाल ईञ्जिनियरिङ्ग परिषद् ऐन तथा नियमावली
१०.. विद्युत ऐन तथा नियमावली

11. Instructional Skills

- Develop a lesson plan
- Develop a session plan (5D method)
- Demonstrate a skill
- Use basic platform skills
- Give an illustrated talk
- Prepare wall charts / flip charts
- Develop PowerPoint slides
- Develop performance guide

- Develop product rating instrument
- Construct knowledge test
- Develop multiple -choice test items.

१२. कार्यालयमा कम्प्युटर प्रयोग

Microsoft Office (Ms-Word, Ms-Excel, PowerPoint) सम्बन्धी जानकारी ॥

॥॥ समाप्त ॥॥

1.